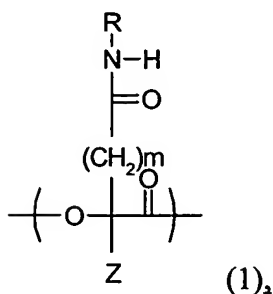


## B. Claims

The following is a complete listing of the claims, and replaces all earlier versions and listings.

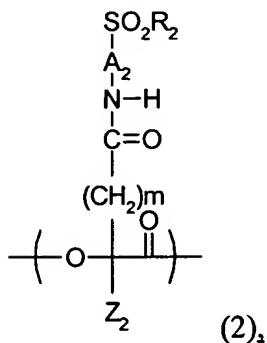
1. ~~(Currently Amended) Polyhydroxyalkanoate comprised of A~~  
polyhydroxyalkanoate comprising at least a unit represented by a chemical formula (1)  
within ~~the a~~ molecule:



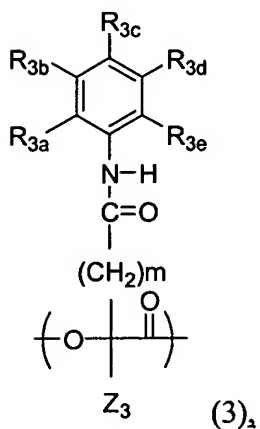
wherein R represents -A<sub>1</sub>-SO<sub>2</sub>R<sub>1</sub>; R<sub>1</sub> represents OH, a halogen atom, ONa, OK or OR<sub>1a</sub>; R<sub>1a</sub> and A<sub>1</sub> each independently represents a group having a substituted or unsubstituted aliphatic hydrocarbon structure, a substituted or unsubstituted aromatic ring structure or a substituted or unsubstituted heterocyclic structure; m represents an integer selected from 0-8; Z represents a linear or branched alkyl group, an aryl group or an aralkyl group substituted with an aryl group; and in case plural units are present, R, R<sub>1</sub>, R<sub>1a</sub>, A<sub>1</sub>, m and Z have the aforementioned meanings independently for each unit.

2. ~~(Currently Amended) Polyhydroxyalkanoate The~~  
polyhydroxyalkanoate according to claim 1, ~~comprised of~~comprising, as the unit

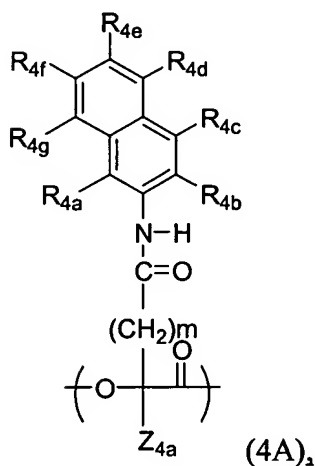
represented by the chemical formula (1), at least a unit represented by a chemical formula (2), a chemical formula (3), a chemical formula (4A) or (4B), within a molecule:



wherein  $\text{R}_2$  represents OH, a halogen atom, ONa, OK or  $\text{OR}_{2a}$ ;  $\text{R}_{2a}$  represents a linear or branched alkyl group with 1 to 8 carbon atoms or a substituted or unsubstituted phenyl group;  $\text{A}_2$  represents a linear or branched alkylene group with 1 to 8 carbon atoms;  $m$  represents an integer selected from 0 - 8;  $\text{Z}_2$  represents a linear or branched alkyl group, an aryl group or an aralkyl group substituted with an aryl group; and in case plural units are present,  $\text{A}_2$ ,  $\text{R}_2$ ,  $\text{R}_{2a}$ ,  $m$  and  $\text{Z}_2$  have the aforementioned meanings independently for each unit;

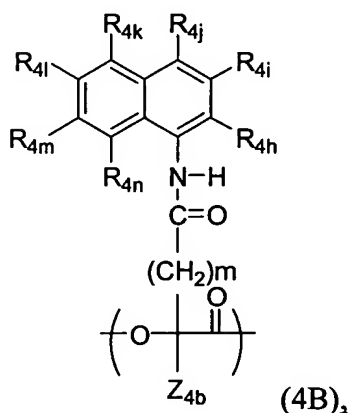


wherein  $R_{3a}$ ,  $R_{3b}$ ,  $R_{3c}$ ,  $R_{3d}$  and  $R_{3e}$  each independently represents  $SO_2R_{3f}$  ( $R_{3f}$  representing OH, a halogen atom, ONa, OK or  $OR_{3f1}$  ( $R_{3f1}$  representing a linear or branched alkyl group with 1 to 8 carbon atoms or a substituted or unsubstituted phenyl group)), a hydrogen atom, a halogen atom, an alkyl group with 1 - 20 carbon atoms, an alkoxy group with 1 - 20 carbon atoms, an OH group, an  $NH_2$  group, an  $NO_2$  group,  $COOR_{3g}$  ( $R_{3g}$  representing a H atom, a Na atom or a K atom), an acetamide group, an OPh group, a NHPH group, a  $CF_3$  group, a  $C_2F_5$  group or a  $C_3F_7$  group (Ph indicating a phenyl group), of which at least one is  $SO_2R_{3f}$ ; m represents an integer selected from 0 - 8;  $Z_3$  represents a linear or branched alkyl group, an aryl group or an aralkyl group substituted with an aryl group; and in case plural units are present,  $R_{3a}$ ,  $R_{3b}$ ,  $R_{3c}$ ,  $R_{3d}$ ,  $R_{3e}$ ,  $R_{3f}$ ,  $R_{3f1}$ ,  $R_{3g}$ , m and  $Z_3$  have the aforementioned meanings independently for each unit;



wherein  $R_{4a}$ ,  $R_{4b}$ ,  $R_{4c}$ ,  $R_{4d}$ ,  $R_{4e}$ ,  $R_{4f}$  and  $R_{4g}$  each independently represents  $SO_2R_{4o}$  ( $R_{4o}$  representing OH, a halogen atom, ONa, OK or  $OR_{4o1}$  ( $R_{4o1}$  representing a linear or branched alkyl group with 1 to 8 carbon atoms or a substituted or unsubstituted phenyl

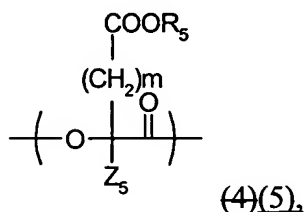
group)), a hydrogen atom, a halogen atom, an alkyl group with 1 - 20 carbon atoms, an alkoxy group with 1 - 20 carbon atoms, an OH group, an NH<sub>2</sub> group, an NO<sub>2</sub> group, COOR<sub>4p</sub> (R<sub>4p</sub> representing a H atom, a Na atom or a K atom), an acetamide group, an OPh group, an NHPPh group, a CF<sub>3</sub> group, a C<sub>2</sub>F<sub>5</sub> group or a C<sub>3</sub>F<sub>7</sub> group (Ph indicating a phenyl group), of which at least one is SO<sub>2</sub>R<sub>4o</sub>; m represents an integer selected from 0 - 8; Z<sub>4a</sub> represents a linear or branched alkyl group, an aryl group or an aralkyl group substituted with an aryl group; and in case plural units are present, R<sub>4a</sub>, R<sub>4b</sub>, R<sub>4c</sub>, R<sub>4d</sub>, R<sub>4e</sub>, R<sub>4f</sub>, R<sub>4g</sub>, R<sub>4o</sub>, R<sub>4ol</sub>, R<sub>4p</sub>, m and Z<sub>4a</sub> have the aforementioned meanings independently for each unit;



wherein R<sub>4h</sub>, R<sub>4i</sub>, R<sub>4j</sub>, R<sub>4k</sub>, R<sub>4l</sub>, R<sub>4m</sub> and R<sub>4n</sub> each independently represents SO<sub>2</sub>R<sub>4o</sub> (R<sub>4o</sub> representing OH, a halogen atom, ONa, OK or OR<sub>4ol</sub> (R<sub>4ol</sub> representing a linear or branched alkyl group with 1 to 8 carbon atoms or a substituted or unsubstituted phenyl group)), a hydrogen atom, a halogen atom, an alkyl group with 1 - 20 carbon atoms, an alkoxy group with 1 - 20 carbon atoms, an OH group, an NH<sub>2</sub> group, an NO<sub>2</sub> group, COOR<sub>4p</sub> (R<sub>4p</sub> representing a H atom, a Na atom or a K atom), an acetamide group, an OPh group, an NHPPh group, a CF<sub>3</sub> group, a C<sub>2</sub>F<sub>5</sub> group or a C<sub>3</sub>F<sub>7</sub> group (Ph indicating a phenyl

group), of which at least one is  $\text{SO}_2\text{R}_{4o}$ ; m represents an integer selected from 0 - 8;  $\text{Z}_{4b}$  represents a linear or branched alkyl group, an aryl group or an aralkyl group substituted with an aryl group; and in case plural units are present,  $\text{R}_{4h}$ ,  $\text{R}_{4i}$ ,  $\text{R}_{4j}$ ,  $\text{R}_{4k}$ ,  $\text{R}_{4l}$ ,  $\text{R}_{4m}$ ,  $\text{R}_{4n}$ ,  $\text{R}_{4o}$ ,  $\text{R}_{4ol}$ ,  $\text{R}_{4p}$ , m and  $\text{Z}_{4b}$  have the aforementioned meanings independently for each unit.

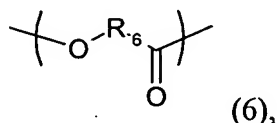
3. (Currently Amended) ~~Polyhydroxyalkanoate comprised of A~~  
polyhydroxyalkanoate comprising at least a unit represented by a chemical formula (5)  
 within a molecule:



wherein  $\text{R}_5$  represents hydrogen, a group capable of forming a salt or  $\text{R}_{5a}$ ;  $\text{R}_{5a}$  represents a linear or branched alkyl group with 1 - 12 carbon atoms, an aralkyl group or a substituent having a sugar; m represents an integer selected from 0 - 8;  $\text{Z}_5$  represents a linear or branched alkyl group, an aryl group or an aralkyl group substituted with an aryl group; however  $\text{R}_5$  only represents a substituent having a sugar in case  $\text{Z}_5$  is a methyl group and m is 0 - 1; and in case plural units are present,  $\text{R}_5$ ,  $\text{R}_{5a}$ , m and  $\text{Z}_5$  have the aforementioned meanings independently for each unit.

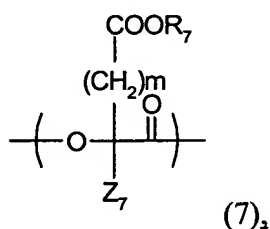
4. (Currently Amended) ~~Polyhydroxyalkanoate~~ The

polyhydroxyalkanoate according to ~~any one of claims 1 to 3~~ claim 1, further ~~comprised~~  
~~of~~comprising a unit represented by a chemical formula (6) within a molecule:



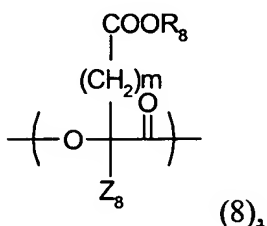
wherein R<sub>6</sub> represents a linear or branched alkylene with 1 - 11 carbon atoms,  
 alkyleneoxyalkylene group (each alkylene group being independently with 1 - 2 carbon  
 atoms), a linear or branched alkenyl group with 1 - 11 carbon atoms or an alkylidene group  
 with 1 - 5 carbon atoms which may be substituted with an aryl group; and in case plural  
 units are present, R<sub>6</sub> has the aforementioned meanings independently for each unit.

5. (Currently Amended) A method for producing a  
 polyhydroxyalkanoate comprising a unit represented by a chemical formula (8), ~~comprised~~  
~~of~~of the method comprising a step of executing hydrolysis of a polyhydroxyalkanoate  
 comprising a unit represented by a chemical formula (7) in the presence of an acid or an  
 alkali, or a step of executing hydrogenolysis comprising a catalytic reduction of a  
 polyhydroxyalkanoate comprising a unit represented by a chemical formula (7):



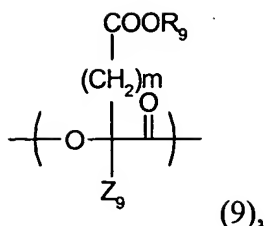
wherein R<sub>7</sub> represents a linear or branched alkyl group with 1 - 12 carbon atoms or an

aralkyl group; m represents an integer selected from 0 - 8;  $Z_7$  represents a linear or branched alkyl group, an aryl group or an aralkyl group substituted with an aryl group, and m represents an integer selected from 2 - 8 in case  $Z_7$  is a methyl group; and in case plural units are present,  $R_7$ , m and  $Z_7$  have the aforementioned meanings independently for each unit;

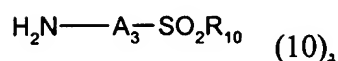


wherein  $R_8$  represents hydrogen, or a group capable of forming a salt; m represents an integer selected from 0 - 8;  $Z_8$  represents a linear or branched alkyl group, an aryl group or an aralkyl group substituted with an aryl group, and m represents an integer selected from 2 - 8 in case  $Z_8$  is a methyl group; and, in case plural units are present,  $R_8$ , m and  $Z_8$  have the aforementioned meanings independently for each unit.

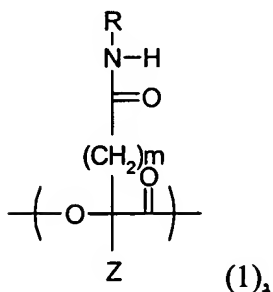
6. (Currently Amended) A method for producing a polyhydroxyalkanoate comprising a unit represented by a chemical formula (1), ~~comprised~~ of the method comprising a step of executing a condensation reaction of a polyhydroxyalkanoate comprising a unit represented by a chemical formula (9) and an amine compound represented by a chemical formula (10):



wherein  $R_9$  represents hydrogen, or a group capable of forming a salt;  $m$  represents an integer selected from 0 - 8;  $Z_9$  represents a linear or branched alkyl group, an aryl group or an aralkyl group substituted with an aryl group; and, in case plural units are present,  $m$ ,  $R_9$  and  $Z_9$  have the aforementioned meanings independently for each unit;



wherein  $R_{10}$  represents OH, a halogen atom, ONa, OK or  $\text{OR}_{10a}$ ;  $R_{10a}$  and  $A_3$  each independently is selected from a group having a substituted or unsubstituted aliphatic hydrocarbon structure, a substituted or unsubstituted aromatic ring structure, or a substituted or unsubstituted heterocyclic structure; and, in case plural units are present,  $R_{10}$ ,  $R_{10a}$  and  $A_3$  have the aforementioned meanings independently for each unit;

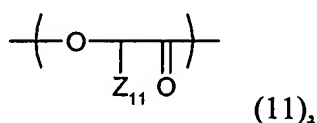


wherein  $R$  represents  $-\text{A}_1\text{---SO}_2\text{R}_1$ ;  $R_1$  represents OH, a halogen atom, ONa, OK or  $\text{OR}_{1a}$ ;  $R_{1a}$



and A<sub>1</sub> each independently represents a group having a substituted or unsubstituted aliphatic hydrocarbon structure, a substituted or unsubstituted aromatic ring structure or a substituted or unsubstituted heterocyclic structure; m represents an integer selected from 0-8; Z represents a linear or branched alkyl group, an aryl group or an aralkyl group substituted with an aryl group; and in case plural units are present, R, R<sub>1</sub>, R<sub>1a</sub>, A<sub>1</sub>, m and Z have the aforementioned meanings independently for each unit.

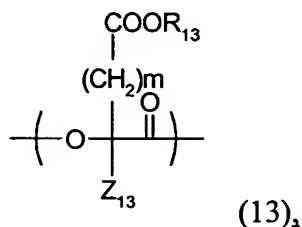
7. (Currently Amended) A method for producing a polyhydroxyalkanoate comprising a unit represented by a chemical formula (13),  
~~comprised of the method comprising:~~  
 a step of reacting a polyhydroxyalkanoate comprising a unit represented by a chemical formula (11) with a base; and  
 a step of reacting a compound obtained in the aforementioned step with a compound represented by a chemical formula (12):



wherein Z<sub>11</sub> represents a linear or branched alkyl group, an aryl group or an aralkyl group substituted with an aryl group; and in case plural units are present, Z<sub>11</sub> has the aforementioned meanings independently for each unit;



wherein m represents an integer selected from 0 - 8; X represents a halogen atom; and R<sub>12</sub> represents a linear or branched alkyl group with 1 - 12 carbon atoms or an aralkyl group;

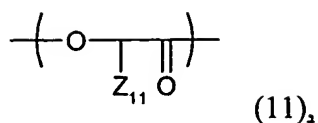


wherein m represents an integer selected from 0 - 8; R<sub>13</sub> represents a linear or branched alkyl group with 1 - 12 carbon atoms or an aralkyl group; Z<sub>13</sub> represents a linear or branched alkyl group, an aryl group or an aralkyl group substituted with an aryl group, and m represents an integer selected from 2 - 8 in case Z<sub>13</sub> is a methyl group; and in case plural units are present, R<sub>13</sub>, m and Z<sub>13</sub> have the aforementioned meanings independently for each unit.

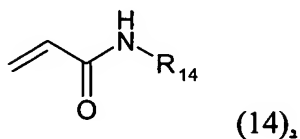
8. (Currently Amended) A method for producing a polyhydroxyalkanoate comprising a unit represented by a chemical formula (15),  
~~comprised of~~ the method comprising:

a step of reacting a polyhydroxyalkanoate comprising a unit represented by a chemical formula (11) with a base; and

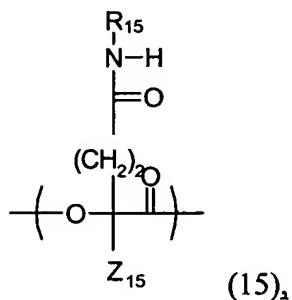
a step of reacting a compound obtained in the aforementioned step with a compound represented by a chemical formula (14):



wherein  $\text{Z}_{11}$  represents a linear or branched alkyl group, an aryl group or an aralkyl group substituted with an aryl group; and in case plural units are present,  $\text{Z}_{11}$  has the aforementioned meanings independently for each unit;



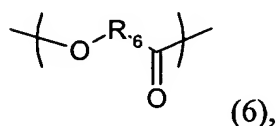
wherein  $\text{R}_{14}$  represents  $-\text{A}_{14}-\text{SO}_2\text{R}_{14a}$ ;  $\text{R}_{14a}$  represents OH, a halogen atom, ONa, OK or  $\text{OR}_{14b}$ ;  $\text{R}_{14b}$  and  $\text{A}_{14}$  each independently is selected from a group having a substituted or unsubstituted aliphatic hydrocarbon structure, a substituted or unsubstituted aromatic ring structure or a substituted or unsubstituted heterocyclic structure; and in case plural units are present,  $\text{R}_{14}$ ,  $\text{R}_{14a}$ ,  $\text{R}_{14b}$ , and  $\text{A}_{14}$  have the aforementioned meanings independently for each unit;



wherein  $\text{R}_{15}$  represents  $-\text{A}_{15}-\text{SO}_2\text{R}_{15a}$ ;  $\text{R}_{15a}$  represents OH, a halogen atom, ONa, OK or  $\text{OR}_{15b}$ ;  $\text{R}_{15b}$  and  $\text{A}_{15}$  each independently represents a group having a substituted or

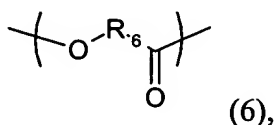
unsubstituted aliphatic hydrocarbon structure, a substituted or unsubstituted aromatic ring structure or a substituted or unsubstituted heterocyclic structure;  $Z_{15}$  represents a linear or branched alkyl group, an aryl group or an aralkyl group substituted with an aryl group; and in case plural units are present,  $R_{15}$ ,  $R_{15a}$ ,  $R_{15b}$ , and  $A_{15}$  have the aforementioned meanings independently for each unit.

9. (New) The polyhydroxyalkanoate according to claim 2, further comprising a unit represented by a chemical formula (6) within a molecule:



wherein  $R_6$  represents a linear or branched alkylene with 1 - 11 carbon atoms, alkyleneoxyalkylene group (each alkylene group being independently with 1 - 2 carbon atoms), a linear or branched alkenyl group with 1 - 11 carbon atoms or an alkylidene group with 1 - 5 carbon atoms which may be substituted with an aryl group; and in case plural units are present,  $R_6$  has the aforementioned meanings independently for each unit.

10. (New) The polyhydroxyalkanoate according to claim 3, further comprising a unit represented by a chemical formula (6) within a molecule:



wherein  $R_6$  represents a linear or branched alkylene with 1 - 11 carbon atoms, alkyleneoxyalkylene group (each alkylene group being independently with 1 - 2 carbon atoms), a linear or branched alkenyl group with 1 - 11 carbon atoms or an alkylidene group with 1 - 5 carbon atoms which may be substituted with an aryl group; and in case plural units are present,  $R_6$  has the aforementioned meanings independently for each unit.